

**NATURAL RESOURCES CONSERVATION SERVICE  
CONSERVATION PRACTICE STANDARD**

**CROSS WIND RIDGES**

(Ac.)  
CODE 588

**DEFINITION**

Ridges formed by tillage, planting or other operations and aligned across the direction of erosive winds.

other conservation measures such as seasonal residue management, or other conservation tillage practices.

**Additional Criteria to Protect Growing Crops from Damage by Wind-Borne Soil Particles.**

**PURPOSE**

Reduce soil erosion from wind.

Protect growing crops from damage by wind-borne soil particles.

Reduce soil particulate emissions to the air.

During those periods when sensitive crops are susceptible to damage by wind-borne soil particles, wind erosion shall not exceed the crop tolerance to blowing soil as specified in the National Agronomy Manual, other accepted references or other planned crop protection objectives.

**CONDITIONS WHERE PRACTICE APPLIES**

This practice applies to cropland.

It is best adapted on soils that are stable enough to sustain effective ridges and cloddiness, such as loamy and clayey soil materials.

It is not well adapted on soils with lower aggregate stability such as sandy soil materials and certain organic soils.

**CONSIDERATIONS**

Tillage should be performed in a direction as close to perpendicular to the prevailing wind direction, during the critical erosion period, as possible. In no case shall the orientation exceed 45 degrees from perpendicular to the erosive wind direction during a critical wind erosion period.

Use tillage speeds in excess of 3.5 miles per hour (mph) for greater effectiveness. Use low speed when the compacted soil horizon is relatively unstable and close to the soil surface.

**CRITERIA**

**General Criteria Applicable to All Purposes**

The ridge orientation, height, spacing, and direction.

Acceptable combinations of ridge height, spacing and direction are those having ridge roughness Krd values equal to 0.8 or less during those periods when wind erosion is expected to occur. Ridge roughness is discussed in the National Agronomy Manual, Subpart 502.32, and K values are displayed in Exhibit 502-4 or 502-5.

The currently approved wind erosion prediction technology shall be used in conjunction with

Optimum ridges are two to eight inches in height, have a ridge to height ratio (h/s) of one to four (example: two inch ridges at eight inches apart), and have surface clods of one to four inches in diameter.

Tillage should be deep enough to contact soil horizons to bring clods to the surface. Depth shall not be less than two inches and not more than eight inches for the application of this practice.

The duck-foot cultivator is best for lifting clods on medium textured soils. Duck-foot cultivators make higher ridges than chisels. Wider spacing of duck-foot shovels is feasible if the

if the soil sufficiently cloddy. Narrow chisels, preferably heavy-duty type, are best on compact soils of substantial clay content. In extremely loose or sandy soils, the lister or shovel type attachments are most effective.

In no case shall the ridge spacing be more than four times the ridge height during wind erosion periods.

Adjacent fields, roads or field corners may need treatment to stop saltation of soil particles onto fields protected by cross wind ridges.

Cross wind ridges are most effective where the soil erodibility index, (I) is 104 or lower. To be effective in coarse textured soils such as very fine sandy loams, fine sandy loams, sandy loams, and sand soils cross wind ridges should be established when soil is moist. Ridges on these soils will deteriorate quickly and shorten the protection period.

Cross wind ridges may be created at right angles to the predominant erosive wind direction on bare unprotected fields as a form of emergency tillage to reduce wind erosion. However, cross wind ridges generally have a temporary impact on reducing wind erosion; which may not last throughout the critical wind erosion period.

## PLANS AND SPECIFICATIONS

Specifications shall be recorded using WY-ECS-80 and narrative statement in the conservation plan will state the conservation practice purpose.

## OPERATION AND MAINTENANCE

Ridges shall be established or re-established by equipment such as chisel plows, drills with hoe openers, or other implements that form effective ridges.

After establishment, ridges shall be maintained through those periods when wind erosion is expected to occur, or until growing crops provide enough cover to protect the soil from wind erosion.

If ridges become ineffective they shall be re-established unless doing so would damage a growing crop.

## REFERENCES

Skidmore, E.L. and N.P. Woodruff. 1968. Wind erosion forces in the United States and their use in predicting soil loss. U.S. Department of Agriculture. Agriculture Handbook No. 346.

U.S.D.A. Natural Resources Conservation Service. 2002. National Agronomy Manual. 190-V. 3<sup>rd</sup> ed., Part 502 Wind Erosion.

Soil Survey Division Staff. 1993. Soil Survey Manual. United States Department of Agriculture Handbook 18.